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EXAMINER

BOMAR, THOMAS S

ART UNIT PAPER NUMBER

3672

DATE MAILED: 08/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/607,510

Applicant(s)

ROBERTS, JOHN

Examiner

Shane Bomar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,7-11,13-17,21-26,28,29,31-38 and 40-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,7-11,13-17,21-26,28,29,31-38 and 40-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: amended claim 1 states that the sonic wave generator comprises a solid state device, although the phrase “solid state device” was never used as a description of the sonic wave generator, nor was the phrase found anywhere in the specification. NOTE: This is a repeat of the objection presented in the last Office Action that was not addressed in the current amendment or arguments.

Claim Objections

2. Claim 29 is objected to because of the following informalities: the recitation of “a neutral weight position” should most likely be --the neutral weight position-- since this limitation is already set forth in claim 26. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 2,948,059 to Bodine in view of US patent 6,009,948 to Flanders et al.

Regarding claim 1, Bodine teaches a back-off tool for use in the tubular member disposed inside a wellbore that comprises a housing 103 and at least one sonic wave generator 102

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mounted within the housing (see Figs. 2-3, col. 7, lines 33-37 and col. 8, lines 50-56), and a controller coupled to the sonic wave generator, the controller is configured to vary at least one of amplitude, frequency, and resonance of the sonic wave (see col. 16, lines 17-66, especially lines 53-61, and claims 3-4). It is not, however, taught that the sonic wave generator comprises a solid-state device as is currently claimed.

Flanders et al teach a sonic wave generator for use in the tubular member disposed inside a wellbore that comprises a housing similar to that of Bodine (see Fig. 1 and Summary of the Invention in columns 2-3). It is further taught that the sonic wave generator comprises a solid-state device since a piezoelectric device is well known as a solid-state device (see col. 8, lines 46-48). It would have been obvious to one of ordinary skill in the art, having the teachings of Bodine and Flanders et al before him at the time the invention was made, to modify the sonic wave generator taught by Bodine to include the solid-state device of Flanders et al, in order to obtain a device that can generate sufficient energy to vibrate the tubular member. One would have been motivated to make such a combination since Flanders et al have shown that piezoelectric devices are suitable equivalents of an electromechanical device (see col. 8, lines 36-48 of Flanders et al), wherein the device of Bodine is electromechanical (see col. 6, lines 51-66 of Bodine). A further motivation for combining these references is the fact that Bodine teaches another application for the device is to remove stuck pipe in a wellbore (see col. 2, lines 13-19 of Bodine), which is an important application of the Flanders et al device (see col. 3, lines 12-15 of Flanders et al).

Regarding claims 35-38, the combination applied to claim 1 above teaches that the waves can be constant or variable (see col. 9, lines 20-74 of Bodine).

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5. Claims 2, 5, 7, 11, 13, 14, 24, 25, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine in view of Flanders et al as applied to claim 1 above, and further in view of US patent 5,037,524 to Juvan.

Regarding claim 2, the combination applied to claim 1 above teaches a back-off tool with a sonic wave generator that comprises a solid-state device. It is not, however, explicitly taught that the solid-state device is one of a piezoelectric ceramic and a stack of piezoelectric plates.

Juvan teaches a sonic wave generator that comprises a solid-state device similar to that of the combination (see col. 17, lines 23-26 and col. 25, lines 14-17). It is further taught that the solid-state device is one of a piezoelectric ceramic and a stack of piezoelectric plates (see col. 24, lines 65-67 and col. 25, lines 42-56). It would have been obvious to one of ordinary skill in the art, having the teachings of the combination and Juvan before him at the time the invention was made, to modify the solid-state device taught by the combination to include the solid-state device that is one of a piezoelectric ceramic and a stack of piezoelectric plates of Juvan, in order to obtain an increase in operating efficiency, as taught by Juvan. One would have been motivated to make such a combination since Juvan has shown it to be notoriously known in the solid-state sonic wave generator art to use at least one of a piezoelectric ceramic and a stack of piezoelectric plates as the solid-state device in order to increase operating efficiency and to extend the life of the system (see col. 17, lines 23-26 and col. 25, lines 14-17).

Regarding claims 5, 11, 13, and 24, the combination and motivation applied to claim 2 above analogously teaches an apparatus and method for loosening a threaded connection joining an upper portion and a lower portion of a tubular member, and a back-off tool for use in the tubular member disposed inside a wellbore that comprises: a housing 103; a wireline C for

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lowering the tool through the tubular member (see Fig. 3 of Bodine); a power supply for delivering signals (see col. 8, lines 1-7 of Bodine); and at least one sonic wave generator mounted within the housing, wherein a controller coupled to the sonic wave generator is configured to vary at least one of amplitude, frequency, and resonance of the sonic wave (see col. 16, lines 17-66, especially lines 53-61, and claims 3-4 of Bodine), and wherein the sonic wave generator is at least one of a piezoelectric ceramic and a stack of piezoelectric plates (see col. 24, lines 65-67 and col. 25, lines 42-56 of Juvan). The sonic wave generator is further taught as being activated while reciprocating the tubular member (see col. 10, lines 28-35 of Bodine).

Regarding claim 7, the combination applied to claim 5 above teaches that the sonic waves are configured to loosen the threaded connection (see col. 1, lines 15-18 of Bodine).

Regarding claim 14, the combination applied to claim 11 above teaches that the method or apparatus further comprises means for applying a reverse torque to the tubular (see col. 9, lines 9-19 of Bodine).

Regarding claims 25 and 31, the combination applied to claims 5, 11, and 24 above similarly teaches the limitations of claims 25 and 31 as well as the further limitation of moving the back-off tool up and down the tubular member. It would have been obvious to one of ordinary skill in the art to move the back-off tool up and down depending on the size of the connection to be loosened, or if more than one connection needed to be loosened. In other words, if the connection to be loosened were larger than the back-off tool, then the tool would obviously need to be moved up and down to apply waves over the whole connection. Or, if more

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than one connection needed to be loosened, than the tool would be moved down to the first connection, and then moved up or down to the next connection to loosen it.

6. Claims 8-10, 16, 17, 21, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine in view of Flanders et al and Juvar as applied to claims 1 and 5 above, and further in view of US patent 6,012,521 to Zunkel et al.

Regarding claims 8-10, 16, and 42, the combination applied to claims 1 or 5 above teaches the method and apparatus for loosening a threaded connection using a sonic wave generator in a wellbore. It is not taught that there are two or more wave generators positioned at two or more locations, wherein the two or more generators are positioned so that a combination of the waves is greater than the plurality of waves from one generator, or that the two generators are configured to be activated simultaneously or at predefined times.

Zunkel et al teaches a wave generator similar to that of the combination. It is further taught that there are more than two wave generators, the combined waves from the generators is substantially greater than the waves from one generator, and that the two generators are configured to be activated simultaneously and/or at predefined times (see col. 11, lines 35-54). It would have been obvious to one of ordinary skill in the art, having the teachings of the combination and Zunkel et al before him at the time the invention was made, to modify the method and apparatus taught by the combination to include the two or more wave generators of Zunkel et al. One would have been motivated to make such a combination since Zunkel et al have shown it to be notoriously known in the art that pressure (i.e., sonic) wave generators spaced apart in a work string will have an additive wave field intensity.

Regarding claim 17, the combination applied to claim 16 above teaches that the sonic waves are configured to loosen the threaded connection (see col. 1, lines 15-18 of Bodine).

Regarding claim 21, the combination applied to claim 16 above teaches that the method further comprises means for applying a reverse torque to the tubular (see col. 9, lines 9-19 of Bodine).

7. Claims 15, 22, 23, 26, 28, 29, 32-34, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine in view of Flanders et al and Juvan and/or Zunkel as applied to claims 11 and 16 above, and further in view of US patent 2,305,261 to Kinley.

Regarding claims 15 and 22, the combination applied to claims 11 or 16 above teaches the method and apparatus for loosening a threaded connection using a sonic wave generator in a wellbore. It is not taught that the method or apparatus further comprises means for setting the tubular to a neutral weight position at the threaded connection above a sticking condition.

Kinley teaches a method and apparatus for loosening a threaded connection similar to that of the combination. It is further taught that the tubular is set to a neutral weight position at the threaded connection (see page 1, col. 1, lines 51-54 and page 2, col. 1, lines 50-54). It would have been obvious to one of ordinary skill in the art, having the teachings of the combination and Kinley before him at the time the invention was made, to modify the method and apparatus taught by the combination to include the means for setting the tubular to a neutral weight position of Kinley. One would have been motivated to make such a combination in order to relieve the threaded connection of the weight of the string, as taught by Kinley.

Regarding claims 23, 26, 29, and 41, the combination applied to claims 15 and 22 similarly applies. Furthermore, since Bodine teaches that the tubular member is reciprocated and

Kinley teaches the neutral weight position of the tubular, then it would have been obvious to one of ordinary skill in the art that the neutral weight position of the tubular according to this combination would move up and down the tubular as the tubular is reciprocated.

Regarding claim 28, the combination applied to claim 26 above teaches that the method further comprises activating the back-off tool to generate the sonic waves (see col. 8, lines 33-42 of Bodine).

Regarding claims 32, the combination applied to claim 26 above teaches that the waves can be constant or variable (see col. 9, lines 20-74 of Bodine).

Regarding claim 33, the combination applied to claim 26 above teaches that the method further comprises retrieving the upper portion from the wellbore (see col. 6, lines 37-43 of Bodine).

Regarding claim 34, the combination applied to claim 26 above teaches that the method further comprises generating the plurality of sonic waves (see col. 1, lines 15-18 of Bodine) and inherently retrieving the back-off tool since it is well known in the art to retrieve tools after use to avoid junk in the well.

8. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine.

Bodine teaches an apparatus for loosening a threaded connection joining an upper portion and a lower portion of a tubular member comprising means for lowering a back-off tool through the tubular to a position substantially proximate the connection, and means for generating sonic waves at a selected frequency while moving the back-off tool up and down the tubular member. It would have been obvious to one of ordinary skill in the art to move the back-off tool up and down depending on the size of the connection to be loosened, or if more than one connection

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needed to be loosened. In other words, if the connection to be loosened were larger than the back-off tool, then the tool would obviously need to be moved up and down to apply waves over the whole connection. Or, if more than one connection needed to be loosened, then the tool would be moved down to the first connection, and then moved up or down to the next connection to loosen it.

Response to Arguments

9. Applicant's arguments filed 6/27/2005 have been fully considered but they are not persuasive. The arguments first state that Bodine and Flanders et al fail to teach or suggest a controller for varying at least one of an amplitude, frequency, and resonance of the sonic wave. The Examiner respectfully disagrees because it appears that in column 16, lines 53-61 and claims 3 and 4 of Bodine, as well as columns 3, lines 20-30 and lines 56-60 of Flanders et al, it is clearly taught that each references relies on a controller to do that which is claimed. It is then argued that it is not taught that two or more sonic wave generators are activated simultaneously. The Examiner respectfully contends that the teaching in column 11, lines 43-54 of Zunkel et al that the generators can be operated in or out of phase would inherently encompass activating the generators simultaneously depending on the phase chosen.

While it was stated that claim 24 was written in independent form since it was previously indicated as allowable, the Examiner respectfully contends that this is not the case. The limitation of claim 23 has been removed from claim 24, although claim 24 originally depended from claim 23 and would require its limitations as well as that of claim 16. However, it has been concluded that since Bodine teaches that the tubular member is reciprocated and Kinley et al

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teach the concept of the neutral weight position, then it would be obvious that the neutral weight position would move up and down the tubular as the tubular is reciprocated. Furthermore, the Applicant has defined the setting of the neutral weight position as being accomplished by reciprocation of the tubular, which Bodine clearly teaches.

Lastly, the Examiner respectfully asserts that the references applied above do teach that the back-off tool is moved up and down the tubular since the movement of the tool would depend upon the size of the connection to be loosened, or if more than one connection needed to be loosened, as exemplarily shown in the rejection of claim 40.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane Bomar whose telephone number is 571-272-7026. The examiner can normally be reached on Monday - Thursday from 7:00am to 4:30pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David J. Bagnell
Supervisory Patent Examiner
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tsb



August 23, 2005